A STUDY OF MUSICAL TALENT
OF 102 ELEMENTARY SCHOOL PUPILS

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Roseland Days

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INTRODUCTION

Statement of the Problem.-- This study involved sex and grade comparisons of 102 elementary school pupils on three different tests of musical talent.

Statement of the Purpose.-- The purpose of this study was to make the following comparisons:-

1. A comparison was made of the fourth and fifth grade pupils on the Seashore test.
2. The sexes of the fourth and fifth grades were compared on the Seashore test.
3. A comparison was made of the sixth and seventh grades on the Seashore test.
4. The sexes of the sixth and seventh grades were compared on the Seashore test.
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9. A comparison was made of the fourth and fifth grades on the Drake test.
10. The sexes of the fourth and fifth grades were compared on the Drake test.
11. The sixth and seventh grades were compared on the Drake test.
12. A comparison was made of the sexes of the sixth and seventh grades on the Drake test.
13. Five students who excelled in the music tests were selected, and profiles were made to show musical talent and general achievement.

Collection of Data.-- The subjects involved in this study were one-hundred-two pupils enrolled at the Oglethorpe Elementary School, Atlanta, Georgia. The subjects varied in age from eight to twelve years. There were twenty-seven fourth grade pupils, twenty-six fifth grade pupils, twenty-four sixth grade pupils, and twenty-five seventh grade pupils. There were forty-nine females and fifty-three males.

The tests used in this study were:

1. The Seashore Measures of Musical Talents.
2. The Whistler-Thorpe Musical Aptitude Test.
3. The Drake Musical Memory Test.

The late Dr. C. E. Seashore of the University of Iowa is a pioneer in the field of testing musical talent. His best known work is "Measures of Musical Talent" which is based on the author's "The Psychology of Musical Talent." This work consists of six Columbia graphophone records.

These include tests of the sense of pitch, of the sense of loudness, of the sense of rhythm, of the sense of time, of the sense of timbre, and of the sense of tonal memory.

The Whistler-Thorpe Aptitude test, a recent test of 1949, by Dr. Harvey S. Whistler and Dr. Louis P. Thorpe is divided into five parts: Rhythm Recognition, Pitch Recognition, Melody Recognition, Pitch Discrimination and Advance Rhythm Recognition.

The Drake Musical Memory Test has also been constructed to measure music talent. This test does not measure any special ability for an instrument or voice. It is rather a test of musicality, that common factor which is necessary for success in any form of musical expression, whether instrumental, vocal or conducting. It cannot determine what form of expression a certain individual should select, or what instrument he should play. It measures musical talent in the broad sense.

The Drake test changes according to time, note and play.

The data of this study were obtained through the following steps:

1. The Seashore Measures of Musical Talent Test was administered to one-hundred-two fourth, fifth, sixth and seventh grade pupils at Oglethorpe Elementary School, Atlanta, Georgia, the spring of 1950. On Monday, March 20, the fourth grade was tested between the hours of ten and eleven-thirty A. M. On Tuesday, March 21, the fifth grade was tested between the hours of ten and eleven. On Wednesday, March 22, the sixth grade was tested between the hours of eleven and twelve-thirty, and on Thursday,

the seventh grade was tested between the hours of ten and eleven. The test was administered informally to the subjects who were seated informally in the music room of the Oglethorpe school building. The subjects were handed a test blank and asked to listen carefully for instructions. Reasonably quiet conditions were maintained. The writer was unassisted in the administration of the test.

2. On Monday, March 27, 1950 at 10:00 A. M. the Whistler-Thorpe Musical Aptitude test was given to the fourth grade. On Tuesday, at 10:30 A. M. the same test was given to the fifth grade. At 10:30 A. M. on Wednesday, this test was administered to the sixth grade, and the same test was given to the seventh grade on Thursday morning at 10:30 A. M.

3. On Monday, April 3, 1950, the Drake Musical Memory test was given to the fourth grade at 10:00 A. M. On Tuesday, the same test was given to the fifth grade between the hours of one and two-thirty P. M. On Wednesday, this test was given to the sixth grade at 11:00 A. M. and Thursday to the seventh grade at 1:00 P. M.

Before each test directions were given and also a few introductory remarks were made by the writer to motivate the subjects to put forth the greatest possible effort. Oral practice was conducted for each test before any responses were recorded on the blanks.

For the Seashore test the phonograph was used, but for the Whistler-Thorpe and Drake tests the piano was used.

The data collected were scored, analyzed, and interpreted. Measures of central tendency, variability, and significance were found after which the data were presented in tabular and graphic forms.

Relevant Literature on the Problem.-- The literature related to this study may be divided into the following categories:-

1. Sex differences and music.
2. Information concerning musical training, and its effect upon other things.
3. Information concerning racial characteristics.
4. Information concerning intelligence as related to music.
5. Information concerning the effect that training has upon test scores.

In considering the first category, sex differences and music, Seashore reports that there are no appreciable sex differences in pitch discrimination.[1]

Gilbert writes that.--

> "an assumed sex difference is reflected in the social stereotype that women are 'more artistic' than men, and that the pursuit of the Arts is more or less a peculiarly feminine activity. This stereotype seems to be supported by sex differences on certain tests particularly those of musical talent."[2]

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[1] Carl E. Seashore, The Psychology of Musical Talent (Boston, 1919), p. 288.

[2] G. M. Gilbert, "Sex Differences in Musical Aptitude and Training," The Journal of General Psychology, XVI January, 1942, p. 19.

Smith concluded that the superiority of elementary school girls over elementary school boys may fully be accounted for by the prevailing traits of aloofness of the preadolescent boy towards music as girlish and so to be avoided.[1]

In the summary of the first category, Seashore reports no appreciable difference in sex and music. Gilbert writes that an assumed sex difference which is reflected in the social opinion that women are more artistic than men is untrue. Smith concludes that elementary girls rate higher than boys because of the prevailing trait of aloofness.

In considering the second category, information concerning musical training and its effect upon other things, Professor Edward L. Thorndike of Columbia University states that music study will not give one capabilities or skills in other fields. For instance, if one plays the piano, one will only get finger skill for that instrument, but not for the typewriter. On the other hand, Dr. Charles Eliot, former president of Harvard has said: "Music rightly taught is the best mind trainer on the list."

> Mursell states: Musical training issues in three great functional outcomes - listening, performing, and composing. Each is a cut of musical skill and none of them is possible without some measure of musicianship.[2]

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1 F. O. Smith, "The Effect of Training in Pitch Discrimination," Psychological Monographs, XVI (1914), p. 83.

2 James L. Mursell, Principles of Musical Education (New York, 1927) p. 9.

> Elizabeth Green states: "A mind which is active and alert can accomplish much in a short time. A mind trained to read music at sight with the required speed of reaction is bound to have developed powers of concentration away beyond the mind that putters along at any speed its possessor may happen to desire to use at the moment."[1]

In summarizing the second category, Professor Edward L. Thorndike states that music study will not give one capabilities or skills in other fields. Dr. Charles Eliot states that music rightly taught is the best mind trainer on the list. Mursell states that musical training issues in three great functional outcomes - listening, performing, and composing. Each is a cut of musical skill and none of them is possible without some measure of musicianship. Elizabeth Green states that a mind trained to read music at sight is bound to have developed powers of concentration.

In considering the third category, information concerning racial characteristics, Johnson[2] has made a study using five of the Seashore Measures of Musical Talent on 3300 American Negroes in the fifth and eighth grades. He found that small differences existed between the Negroes and the Whites, although, he states, that there is a clearer trend toward Negro superiority in the sense of rhythm.

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[1] Elizabeth A. H. Green, "How Music Helps With Other Studies," Etude, LXV, (May, 1947), p. 293.

[2] C. B. Johnson, A Study of the Musical Talent of the American Negro. Univ. of N. C., Thesis, 1927, p. 78.

Lenoir[1] in a study with about two hundred colored fifth grade children concluded that the colored children are superior to the white children in both the sense of time and the sense of rhythm.

In summarizing the third category, Johnson writes that there is Negro superiority in the sense of rhythm. Lenoir writes of Negro superiority in the sense of time and rhythm.

In considering the fourth category, information concerning intelligence as related to music, Carl E. Seashore states:

> "Rating on intelligence as a supplement to measurement of musical talent is one of the best indices for the prediction of success in musical education or a musical career."[2]

> "The limits and characteristics of the effective life of a musician are set largely by the limits of his intelligence or natural aptness in motor skills."[3]

Thurstone[4] states that on the general use of a single index of intelligence the single intelligence should be discontinued because of its inconsistencies.

A better method is to describe each person in terms of a "profile" of abilities in which it is frankly recognized that two men may have the same general level of mental endowment and yet be different as to aptitudes.

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1 Z. D. Lenoir, Measurement of Racial Differences in Certain Mental and Educational Abilities. University of Iowa, Thesis, 1925.

2 Carl E. Seashore, Psychology of Music, (New York), 1938, p. 8.

3 Ibid. p. 180.

4 L. L. Thurstone, "Testing Intelligence and Aptitude," Hygeia XXV, (September, 1945), p. 32.

> Moos writes: "Active thought elements are vitally concerned in all musical response. That they are predominantly of the conceptual and imaginal by no means removes the musical response from the sphere of intellectual activity. For intrinsically, conceptual and imaginal thought is just as legimate a psychic activity as reflective thinking, extrinsically in the mental economy of the human race, probably far more important."[1]

Seashore[2] says that as is the intelligence of a man, so is his music. If he is in a school for feeble-minded, his music may be spontaneous and appealing to a high degree, but it will, nevertheless, be feeble-minded. If it is the expression of the philosophical and highly trained composer or conductor, it will be a thought creation whether or not it has the more elemental musical appeals which reach the masses.

Doran K. Antrim[3] reports that it has been found that the I. Q. for music students at the High School of Music and Art in New York City is eleven per cent higher than the general level for students in other New York high schools.

Antrim also states that Alexander Blackman of New York City, who has conducted a tots' orchestra, which has appeared on the air and in movie

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1 Jean C. Moos, p. 260.

2 Carl E. Seashore, Psychology of Music (New York, 1938), p. 8.

3 D. K. Antrim, "Do Musical Talents Have Higher Intelligence?" Etude, LIII (March, 1945), p. 128.

shorts, has found that of eight hundred children, the great majority have been double promoted on entering public school, a number triple promoted, and all have shown a noticeable alertness compared to others.

Alumni of Blackman's orchestra have already distinguied themselves in varied fields as well as in music.

According to Blackman, the main reason these youngsters attain good scholastic records on entering school is that they have learned the invaluable lesson of concentration.

Stanton[1] asserted from his studies, that students with profiles indicating high talent had for the most part higher comprehension scores than those with profiles indicating low talent.

Ross[2] tested fifteen hundred forty-one California public school children, grades V through XII, on the Terman Group Test of Mental Ability as well as on the six Seashore tests. Ross found that those pupils who possessed musical talent sufficient to classify them as of superior musical ability were found to be superior to their general population in intelligence.

In conclusion Carl E. Seashore[3] says that intelligence and musical talent are very definitely related. Thurstone thinks that to describe each person in terms of a profile is a better method. Moos states that

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1 H. M. Stanton, Relationship Between Music Talent and Intelligence, The Journal of Educational Psychology, Vol. 33, 1942, p. 432.

2 Ibid. p. 433.

3 Carl E. Seashore, The Psychology of Musical Talent (Boston, 1919), p. 108.

active thought elements are vitally concerned in all musical response. Doran Antrim reports that the majority of Blackman's eight hundred music students showed noticeable alertness. Stanton asserted that pupils with profiles indicating high talent had for the most part high comprehension. Ross found that the most talented students were superior in intelligence also.

The last category has to do with the effect of training on music talent scores.

Before the appearance of the tests on phonograph records a number of studies were made on the effect of training on the improvement of test scores. Notable among these are studies reported by Smith, Seashore and Mount.[1] The results of these studies indicate in general that the capacities in question are relatively elemental in that they do not improve with training to any great extent.

Klaver[2] made a study to determine whether rhythm training tended to improve rhythm discrimination in the intermediate grades. An experimental and central group were used. Both groups were retested at the close of two month period. The experimental group in the meantime had been given very intensive rhythmic drill. It was found that the experimental group showed no improvement.

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1 Ruth Crewdson, Studies on Seashore's Measures of Musical Talent, (Iowa City, 1930), Vol. II. p. 6.

2 N. J. Klaver, The Effect of Training in Rhythm Upon Rhythmic Discrimination in the Intermediate Grades, Univ. of Iowa, Thesis, 1924.

Kwalwasser[1] compared the mean scores of junior high school students who had received no training with those who received ten or more private lessons. The mean for the untrained group on the K-D battery was 176.25, while for the trained group it was 187.50. The difference appeared to be statistically reliable.

Weiner, Bienstock and Drake performed similar tests in training with students who enrolled at the School of Arts and Music. Their conclusion was that the effect of training was not marked.[2]

Halson and Oran Eagleson made a study on "The Identification of Musical Instruments When Heard Directly Over a Public-Address System." They found that some persons without musical training made higher averages than some musicians in identifying instruments.[3]

In concluding the fifth and last category, related literature points toward the idea that the ability to interpret music is relatively independent of training and experience.

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1 J. M. Kwalwasser, Effect of Training Upon Music Talent Tests, Journal of Educational Psychology, Vol. 33, 1942.

2 N. J. Klaver, The Effect of Training in Rhythm Upon Rhythmic Discrimination in the Intermediate Grades, Univ. of Iowa Thesis, 1924.

3 Halson V. Eagleson and Oran W. Eagleson, Identification of Musical Instruments When Heard Directly Over a Public-Address System, Journal of the Acoustical Society of America, XIX March, 1947, p. 342.

CHAPTER II

STATISTICAL TREATMENT OF DATA AND INTERPRETATION OF RESULTS

This study involves sex and grade comparisons as determined by three different tests: - Seashore Measures of Musical Talent, Whistler-Thorpe Musical Aptitude Test, and The Drake Musical Memory Test.

On the Seashore battery the groups are compared with respect to pitch, loudness, time, timbre, rhythm and tonal memory. On the Whistler-Thorpe battery the groups are compared with respect to pitch, rhythm and melody. On the Drake test the groups are compared according to the total number of mistakes made.

The data for this chapter will be discussed according to the purposes in Chapter I, listed in the table of contents.

Comparison of the Fourth and Fifth Grades on the Seashore Test:- As may be seen in Table I, the Seashore battery reveals the mean for the fifth grade to be 4.02 points higher than that for the fourth grade. This when tested by the "t" technique does prove to be statistically reliable on the 5 percent level of confidence.

The fourth grade shows a range of scores from 10 to 35, while the fifth grade's range is from 10 to 50. This range indicates a difference of 15 points. The standard deviations are separated by 3.5 points.

One may conclude that according to Seashore battery, there are 95 chances in a hundred that the fifth grade is superior to the fourth grade.

In the Seashore Manual there are no norms set up for the fourth grade, therefore throughout the interpretation the fourth grade will be classified according to norms set up for the fifth grade. As may be seen in Figure 1, the fourth grade is classified with the poor group in pitch, and the fifth grade with the low average group.

For the sense of loudness the Seashore battery reveals the mean for the fifth grade to be 15.44 higher than that of the fourth grade. This when tested by the "t" technique is reliable.

The range of scores for the fourth grade is from 5 to 45, while that of the fifth grade is from 15 to 45. The standard deviations are separated by 5 points which when tested by the "t" technique showed a significant difference. Therefore, according to these statistics, the two groups are neither equal in central tendencies nor variability.

One may therefore conclude that the fourth grade on the Seashore battery, for the sense of loudness, there are 95 chances in a hundred that the fourth grade is superior to the fifth grade.

According to norms set up by Seashore the fourth and fifth grades are classified with the poor group for the sense of loudness.

Data based on time for the Seashore battery reveals the mean for the fifth grade to be 2.88 points more than that for the fourth grade. This when tested by the "t" technique does not show a significant difference at the .05 level of confidence.

The range of scores for the fourth grade is from 5 to 40, while the fifth grade shows a range from 10 to 45. Such difference indicates that the range of scores is approximately the same. One will note 1.5

points of deviation.

Therefore, the writer concludes that according to statisticians, although the fifth grade is shown to be a few points higher in time discrimination, the difference is not significant.

For tonal memory the Seashore battery reveals the mean for the fifth grade to be 2.24 points more than the fourth grade. This when tested by the "t" technique does not prove significant at the .05 level of confidence.

The range of scores for the fourth grade is from 5 to 40, while the fifth grade shows a range from 10 to 40. This shows that the range for the fourth grade is 5 points more than the fifth grade. The standard deviations are separated by only .5 point.

One may therefore conclude that though a small amount of difference is shown between the fourth and fifth grades for the sense of tonal memory, such difference is not enough to be considered statistically reliable.

For rhythm the Seashore battery reveals the mean of the fifth grade to be 7.84 points higher than that of the fourth grade. This when tested by the "t" technique is significant at the .01 level of confidence.

The range of scores for the fourth grade is from 5 to 35 and for the fifth grade from 10 to 39. One will note that the range for the fourth grade is only 1 point more than that of the fifth grade. The standard deviations are separated by 4.5 points. One will note that the fourth grade has the larger range of scores, and also the larger deviation.

One may therefore conclude that according to the Seashore test there are 99 chances in a hundred that the fifth grade is superior to the fourth grade in the sense of rhythm.

According to Seashore Norms, the fourth grade falls with the low average group and the fifth grade falls with the superior group.

Data on the Seashore test for timbre reveals the mean of the fourth grade to be 7.68 points higher than that of the fifth grade. This when tested by the "t" technique proves significant at the .01 level of confidence.

The range of scores for the fourth grade is from 5 to 50, and for the fifth grade from 15 to 39. This difference indicates that the range for the fourth grade is 11 points more than that of the fifth grade. The standard deviations are separated by 5 points. This difference when tested by the "t" technique proves insignificant. The fourth grade has a larger range of scores and also the larger deviation.

The writer therefore concludes that according to statistics the fourth grade is superior to the fifth grade in the sense of timbre on the Seashore test, and 99 chances in a hundred will prove superior.

According to statistics of data previously discussed the Seashore test reveals that the fifth grade is superior to the fourth grade in the sense of pitch. The fourth grade is superior to the fifth grade in the sense of loudness. The fifth grade is a few points ahead of the fourth grade in time, but not enough to be significant. The fifth grade

is superior to the fourth grade in the sense of rhythm. The fourth grade is superior to the fifth grade in the sense of timbre. For tonal memory the fifth grade is a few points higher than the fourth grade, but not enough to be significant.

TABLE I

COMPARISON OF 27 FOURTH GRADE PUPILS WITH 26 FIFTH GRADE PUPILS ON THE SEASHORE TEST

Tests	Means		Standard Deviations		Difference Between Means	Standard Error of Difference Between Means	t*
	4th Gr.	5th Gr.	4th Gr.	5th Gr.			
Pitch	26.75	30.77	6.00	9.50	4.02	1.66	2.42
Loudness	25.99	10.55	10.50	5.50	15.44	2.32	6.65
Time	30.80	33.68	8.00	9.50	2.88	2.45	1.17
Tonal Memory	19.70	21.94	10.00	10.50	2.24	2.87	.77
Rhythm	20.07	27.91	8.50	4.00	7.84	1.84	4.25
Timbre	29.50	21.82	9.50	4.50	7.68	2.06	3.72

*t at the .05 level of confidence is 2.008

t at the .01 level of confidence is 2.676

Norm Ranks

	10 9	8 7	6 5	4 3	2	1
Talent	Poor	Low Ave.	Ave.	Good	Excel.	Sup.
Pitch	4	5				
Loudness	4, 5					
Time	4	5				
Timbre	4, 5					
Rhythm		4				5
Tonal Memory		4	5			
	10 9	8 7	6 5	4 3	2	1

Norm Ranks

Figure 1.-- Scores of the fourth and fifth grades made on the Seashore Measures of Musical Talent in 1950. The mean of the raw scores are classified according to norm ranks. The numbers 4 and 5 refer to fourth and fifth grades.

Comparison of the Sexes of the Fourth and Fifth Grades on the Seashore Test.— As may be seen in Table 2, the mean for the boys is 4.70 points higher than for the girls in the sense of pitch. This when tested by the "t" technique proves to be significant at the .05 level of confidence.

The range of scores for the fourth and fifth grade girls is 10 to 35 and for the boys 15 to 50. This shows a difference of 10 points, with the boys having the higher range of scores. The standard deviations are separated only by .5 point.

One might conclude that according to the Seashore test for the sense of pitch there are 95 chances in a hundred that the boys are superior to the girls.

According to Seashore norms the fourth and fifth grade girls and boys are classified with the poor group in the sense of pitch.

The Seashore test reveals for loudness that the boys are .24 points higher than the girls. However, this is not significant when tested by the "t" technique.

The range of scores for the girls is 10 to 45 and for the boys 5 to 49. This shows a difference of 9 points, with the boys having the larger range of scores. The standard deviations are separated by 5.5 points, with the boys having the larger deviation.

One might conclude that though the boys are a few points higher in loudness, as revealed by the Seashore test, there is not enough difference to be statistically reliable.

According to Seashore norms the fourth and fifth grade girls and boys are classified with the poor group in the sense of loudness.

For data in the sense of time, the Seashore test reveals that the mean for the girls is .75 points higher than the boys. This when tested by the "t" technique is not statistically reliable.

The range of scores for the girls is from 15 to 40 and for the boys 5 to 49. This difference is 19, with the boys having the larger range of scores. The standard deviations are separated by 3.5 points.

One may conclude that though the girls are a few points higher than the boys, in the sense of time on the Seashore test, that according to statisticians, the difference is not enough to be significant.

According to Seashore norms the girls are classified with the low average group, and the boys with the poor group.

For the sense of tonal memory the Seashore test reveals the mean for the boys to be 1.85 points higher than the girls. This when tested by the "t" technique does not prove statistically reliable.

The range of scores for the girls is from 5 to 34 and for the boys from 5 to 39. This gives a difference of 5 points, with the boys having the larger range of scores. The standard deviations are separated by 1 point. These statistics indicate that these two groups are slightly unequal in measures of central tendencies and variability.

One might conclude that though the Seashore battery reveals the boys slightly higher than the girls in tonal memory, the difference is not enough to be statistically reliable.

According to Seashore norms, the boys and girls fall in the low average group, as seen in Figure 2.

For the sense of rhythm the Seashore test reveals the mean of the boys to be 2.56 points higher than the girls. This when tested by the "t" technique does not prove significant.

The range of scores for the girls is from 10 to 35 and for the boys from 5 to 29. This difference is only one point, with the girls having the larger range. The standard deviations are separated by 1.5 points, with the larger deviation being for the girls.

According to Seashore norms one will note in Figure 2 that the girls are classified with the average group and boys with the good group.

For the sense of timbre the Seashore test reveals the mean of the girls to be 1.99 points higher than the boys. This when tested by the "t" technique is not significant.

The range for the girls is from 20 to 39 and for the boys from 5 to 39. This difference is 15, with the boys showing the larger range. The standard deviations are separated by 5.5 points. This when tested by the "t" technique proves significant.

One may conclude that though the girls are slightly ahead of the boys in the sense of timbre on the Seashore test, the difference is not enough to be significant.

According to Seashore norms for timbre, the boys and girls are classified with the poor group.

One may conclude that for the comparison of the sexes of the fourth and fifth grades on the Seashore test the following results have been found. In the sense of pitch the boys are superior to the girls. In

the sense of loudness the sexes are about the same. The sexes are about the same in the sense of time. The sexes show no significant difference in tonal memory. The sexes are about the same, rhythmically.

TABLE II

COMPARISON OF 27 BOYS AND 26 GIRLS OF THE FOURTH AND FIFTH GRADES ON THE SEASHORE TEST

Tests	Means		Standard Deviations		Difference Between Means	Standard Error of Difference Between Means	t*
	Girls	Boys	Girls	Boys			
Pitch	24.25	28.95	7.50	7.00	4.70	2.03	2.31
Loudness	25.19	25.43	5.00	10.50	.24	2.28	.05
Time	31.18	30.43	6.50	9.00	.75	2.18	3.44
Tonal Memory	16.55	18.40	7.50	8.50	1.85	2.23	.82
Rhythm	22.13	24.69	6.50	5.00	2.56	1.62	1.57
Timbre	29.64	27.65	5.00	10.50	1.99	2.28	.69

*t at the .05 level of confidence is 2.008

t at the .01 level of confidence is 2.676

Norm Ranks

	10 9	8 7	6 5	4 3	2	1
Talent	Poor	Low Ave.	Ave.	Good	Excel.	Sup.
Pitch	G B					
Loudness	G B					
Time	B	G				
Timbre	G B					
Rhythm			G	B		
Tonal Memory		G B				
	10 9	8 7	6 5	4 3	2	1

Norm Ranks

Figure 2.— Scores of the fourth and fifth grade boys and girls made on the Seashore Measures of Musical Talent in 1950. The mean of the raw scores are classified according to norm ranks. These letters, G and B refer to boys and girls.

Comparison of the Sixth and Seventh Grades on the Seashore Test:- As may be seen in Table 3, the Seashore test reveals the mean for the seventh grade to be 12.06 points higher than the sixth grade. This when tested by the "t" technique does prove to be significant on the .01 level of confidence.

The range of scores for the sixth grade is from 10 to 40 and for the seventh grade 25 to 50. This indicates a difference of 5 points. The standard deviations are exactly the same. Though there is no deviation in the two groups they do differ in the range of scores. The sixth grade's range is larger than the seventh grade's.

One may conclude that these data obtained from the Seashore test suggest that there are 99 chances in a hundred that the seventh grade is superior to the sixth grade in the sense of pitch.

According to the Seashore grade norms for the quality of pitch the sixth grade may be classified with the low average group, and the seventh grade with the excellent group as seen in Figure 1.

For data based on the quality of loudness the Seashore test reveals the mean for the seventh grade to be 2.06 points higher than the sixth grade. This when tested by the "t" technique does not prove significant.

The range of scores for the sixth grade is from 20 to 50, and for the seventh grade from 25 to 49. The difference is 6 points. The sixth grade's range is larger than that of the seventh grade's. The standard deviations are separated by 3.63 points.

One may conclude that according to statistics, and the Seashore test, the seventh grade is a few points ahead of the sixth grade in

the sense of loudness, but not enough to be significant.

According to Seashore norms, the sixth grade is classified with the average group, and the seventh grade with the low average group.

For the sense of time the Seashore test reveals the mean for the sixth grade to be .37 points higher than the seventh grade. This when tested by the "t" technique does not prove significant.

The range of scores for the sixth grade is from 15 to 50, and for the seventh grade from 20 to 49. This shows a difference of 10 points. The standard deviations are separated by 2.5 points.

The writer therefore concludes that though the sixth grade is a few points ahead of the seventh grade in time, the difference is insignificant.

According to Seashore norms the sixth grade and seventh grade are classified with the average group in the sense of time.

The Seashore test for the sense of tonal memory reveals the mean for the seventh grade to be 3.16 points higher than the sixth grade. However, this when tested by the "t" technique is insignificant.

The range of scores for the sixth grade is from 5 to 35, and for the seventh grade from 10 to 39. The difference is only one point, with the sixth grade having one point higher in range than the seventh grade. The standard deviations are separated by 2.5 points, with the sixth grade having the higher deviation.

The writer concludes that though the seventh grade is a few points higher than the sixth grade on the Seashore test that there is not enough difference to be significant in tonal memory.

According to Seashore norms the sixth grade is classified in tonal memory with the good group and the seventh grade with the excellent group, as one might note in Figure 2.

For the sense of rhythm the Seashore test reveals the mean for the sixth grade to be 9.64 points higher than the seventh grade. This when tested by the "t" technique proves significant at the .01 level of confidence.

The range of scores for the sixth grade is 15 to 40 and for the seventh grade 20 to 34. This shows a dufference of 21 points with the sixth grade having the larger range of scores. The standard deviations are separated by 3.5 points.

One might conclude that on the Seashore test for the sense of rhythm there are 99 chances in a hundred that the sixth grade is superior to the seventh grade.

According to Seashore norms, as one might note in Figure 3, the sixth and seventh grades are classified with the superior group in the sense of rhythm.

For data based on the sense of timbre the Seashore test reveals the mean for the seventh grade to be 6.48 points higher than the sixth grade. This when tested by the "t" technique proves significant at the .01 level of confidence.

The range of scores for the sixth grade is from 10 to 40, and for the seventh grade from 20 to 50. This shows no difference in the range of scores. The seventh grade shows only .5 point of deviation from the sixth.

According to these statistics the two grades show a significant difference in measures of central tendencies, but no appreciable difference in variability.

The writer thus concludes that according to Seashore test in the sense of timbre the seventh grade is superior to the sixth grade, and 99 chances in a hundred will be superior.

According to Seashore norms, as seen in Figure 3, the sixth grade is classified with the good group and the seventh grade with the excellent group.

TABLE III

COMPARISON OF 24 SIXTH GRADE PUPILS WITH 25 SEVENTH GRADE PUPILS ON THE SEASHORE TEST

Tests	Means		Standard Deviations		Difference Between Means	Standard Error of Difference Between Means	t*
	6th Gr.	7th Gr.	6th Gr.	7th Gr.			
Pitch	30.44	42.50	7.50	7.50	12.06	2.18	5.53
Loudness	35.44	37.50	8.50	4.87	2.06	2.03	1.01
Time	36.27	35.90	5.50	7.00	.37	1.81	.20
Tonal Memory	23.14	26.30	8.50	5.00	3.16	2.04	1.54
Rhythm	37.94	28.30	6.50	3.00	9.64	1.47	6.55
Timbre	30.02	36.50	8.00	8.50	6.48	2.40	2.70

*t at the .05 level of confidence is 2.018

t at the .01 level of confidence is 2.586

Norm Ranks

	10 9	8 7	6 5	4 3	2	1
Talent	Poor	Low Ave.	Ave.	Good	Excel.	Sup.
Pitch		6				
Loudness		7	6			
Time			6, 7			
Timbre		6, 7				
Rhythm						6, 7
Tonal Memory				6	7	
	10 9	8 7	6 5	4 3	2	1

Norm Ranks

Figure 3.— Scores of the sixth and seventh grades on the Seashore Measures of Musical Talent in 1950. The mean of the raw scores are classified according to norm ranks. The numbers 6 and 7 refer to sixth and seventh grades.

Comparison of Sixth and Seventh Grade Boys with Sixth and Seventh Grade Girls:-- As may be seen in Table 4 the Seashore test reveals the mean for the boys, in the sense of pitch to be 1.73 points higher than the mean for the girls. This when tested by the "t" technique does not prove significant.

The range of scores is from 10 to 50 for the girls and from 20 to 49 for the boys. This difference is 11 points, with the girls having a larger range of scores. The standard deviations are separated by 4 points.

One may conclude that according to the Seashore test, the boys are higher than the girls in pitch discrimination, but not enough to be significant.

According to Seashore norms, the girls are classified with the poor group, and the boys with the low average group in pitch discrimination.

For data based on the sense of loudness, the Seashore test reveals the mean for the girls to be 12.32 points higher than the mean for the boys. This when tested by the "t" technique proves to be significant at the .01 level of confidence.

The range of scores for the girls is from 20 to 50, and for the boys from 20 to 49. This gives a difference of only one point, with the girls having the larger range. The standard deviations are separated by 5.5 points, with the girls having the larger deviation.

One may conclude that in the sense of loudness on the Seashore test the girls are superior to the boys, and there are 99 chances in a hundred in favor of this superiority.

According to Seashore norms as seen in Figure 4, the boys are classified with the low average group and the girls with the superior group in the quality of loudness.

The Seashore test reveals, in the sense of time, the mean of the boys to be 5.23 points higher than the mean for the girls. This when tested by the "t" technique is significant at the .05 level of confidence.

The range of scores for the girls is from 20 to 50 and for the boys from 25 to 50. This gives a difference of 15, with the boys having the larger range of scores. The standard deviations are separated by 2 points.

The writer thus concludes that according to the Seashore test, in the sense of time the boys are superior to the girls, and there are 95 chances in a hundred in favor of this superiority.

According to Seashore norms, as may be seen in Figure 4, the girls are classified with the low average group and the boys with the average group.

For tonal memory the Seashore test reveals the mean of the boys to be 6.89 points higher than the mean for the girls. This when tested by the "t" technique is significant at the .01 level of confidence.

The range of scores for the girls is from 5 to 34 and for the boys from 10 to 34. This difference is five points, with the girls having the larger range of scores. The standard deviations are separated by 1.5 points.

One may conclude that according to the Seashore test on the sense of tonal memory there are 99 chances in a hundred that the boys are superior to the girls.

According to Seashore norms, as may be seen in Figure 4, the girls are classified with the low average group and the boys with the excellent group.

The Seashore test reveals for the sense of rhythm that the mean of the girls is .78 higher than the mean of the boys. This when tested by the "t" technique is not significant.

The range of scores for the girls is from 15 to 34, and for the boys from 10 to 34. This difference is 5 points, with the boys having the larger range of scores.

One may conclude that according to the Seashore test the girls are a few points higher than the boys in the sense of rhythm, but not enough to be significant.

According to Seashore test as may be seen in Figure 4, both sexes are classified with the poor group in the sense of rhythm.

For timbre the Seashore test reveals that the mean for the boys is 4.17 points higher than the mean for the girls. This when tested by the "t" technique does not prove significant.

The range of scores for the girls is from 25 to 50 and for the boys from 15 to 50. This difference is 10, with the boys having the larger range of scores.

One may conclude that though the boys are a few points higher in the sense of timbre than the girls, the difference is not enough to be

significant.

According to Seashore norms, as may be seen in Figure 4, the girls are classified with the poor group, and the boys with the low average group.

From previous comparisons of the sexes of the sixth and seventh grades on the Seashore test of pitch discrimination one might make the following conclusions. There is no difference between the sexes on this test. In the sense of loudness the girls are superior to the boys. In the sense of time the boys are superior to the girls. For tonal memory the boys are superior to the girls. The boys and girls are endowed about the same rhythmically. The sexes are about the same in timbre.

TABLE IV

COMPARISON OF 26 SIXTH AND SEVENTH GRADE BOYS WITH 23 SIXTH AND SEVENTH GRADE GIRLS ON THE SEASHORE TEST

Tests	Means		Standard Deviations		Difference Between Means	Standard Error of Difference Between Means	t*
	Girls	Boys	Girls	Boys			
Pitch	30.99	32.72	10.50	6.50	1.73	3.05	.56
Loudness	48.31	35.99	8.00	3.50	12.32	1.76	6.99
Time	32.50	37.73	8.50	6.50	5.23	2.18	2.40
Tonal Memory	20.98	27.87	5.50	6.00	6.89	1.67	4.12
Rhythm	26.64	25.86	4.00	6.00	.78	1.50	.52
Timbre	29.90	34.07	7.50	8.50	4.17	2.34	1.78

*t at the .05 level of confidence is 2.011

t at the .01 level of confidence is 2.683

Norm Ranks

	10 9	8 7	6 5	4 3	2	1
Talent	Poor	Low Ave.	Ave.	Good	Excel.	Sup.
Pitch	G	B				
Loudness		B				G
Time		G	B			
Timbre	G	B				
Rhythm	G B					
Tonal Memory		G			B	
	10 9	8 7	6 5	4 3	2	1

Norm Ranks

Figure 4.— Scores of the sixth and seventh grade boys and girls on the Seashore Measures of Musical Talent in 1950. The mean of the raw scores are classified according to norm ranks. The letters G and B refer to girls and boys.

Comparison of the Fourth and Fifth Grades on the Whistler-Thorpe Test:- The Whistler-Thorpe test, in the sense of pitch, reveals the mean of the fourth grade to be 4.24 points higher than the mean of the fifth grade. This when tested by the "t" technique proves significant at the .01 level of confidence.

The range of scores for the fourth grade is from 6 to 20, and for the fifth grade from 1 to 25. This difference is 10 points, with the fifth grade having the larger range of scores. The standard deviations are separated by .30 points, with the fourth grade having the larger deviation.

One may conclude that the fourth grade is superior to the fifth grade in the sense of pitch on the Whistler-Thorpe test.

According to Whistler-Thorpe norms the fourth grade falls at the 40th percentile and the fifth grade at the 70th percentile, as may be seen in Figure 5.

In the sense of rhythm, Whistler-Thorpe battery reveals the mean of the fifth grade to be 2.50 points higher than the fourth grade. This when tested by the "t" technique does not prove significant.

The scores for the fourth grade range from 6 to 20 and for the fifth grade from 11 to 30. This difference is 5 points, with the fifth grade having the larger range of scores. The standard deviations are separated by 6.5 points. This when tested by the "t" technique proves significant.

One might thus conclude that though the fifth grade has a tendency to exceed the fourth grade rhythmically, the difference is insignificant,

and probably due to chance factors.

According to Whistler-Thorpe norms the fourth grade falls at the 40th percentile and the fifth grade at the 50th percentile, as may be seen in Figure 5.

For melody the Whistler-Thorpe test reveals the mean of the fifth grade to be 6.16 points higher than the mean for the fourth grade. This when tested by the "t" technique is significant at the .01 level of confidence.

The fourth grade scores range from 5 to 30, and the fifth grade from 5 to 20. This gives a difference of 10 points, with the fourth grade having the larger deviation. The standard deviations are separated by 3.35 points, with the fourth grade having the larger deviation.

The writer therefore concludes that the fifth grade is superior to the fourth grade, on the Whistler-Thorpe test in melody, and there are 99 chances in a hundred in favor of this superiority.

According to the Whistler-Thorpe test, as may be seen in Figure 5, the fourth grade falls at the 50th percentile, and the fifth grade at the 90th percentile.

One might conclude that according to the Whistler-Thorpe test, the fourth grade is superior to the fifth grade in pitch. The fourth and fifth grades score about the same on the test of rhythm. The fifth grade is superior to the fourth grade in the sense of melody.

TABLE V

COMPARISON OF 27 FOURTH GRADE PUPILS WITH 26 FIFTH GRADE PUPILS ON THE WHISTLER-THORPE TEST

	Means		Standard Deviations		Difference Between Means	Standard Error of Difference Between Means	t*
	4th Gr.	5th Gr.	4th Gr.	5th Gr.			
Pitch	17.74	13.50	4.00	3.70	4.24	.30	4.70
Rythm	13.50	16.00	4.00	10.50	2.50	2.26	1.10
Melody	12.74	18.90	5.50	2.15	6.16	1.15	5.35

*t at the .05 level of confidence is 2.008

t at the .01 level of confidence is 2.676

Percentiles

Sub-Tests	1	5	10	20	30	40	50	60	70	80	90	95	99	
Rhythm						4	5							
Pitch						5			4					
Melody							4				5			
	1	5	10	20	30	40	50	60	70	80	90	95	99	

Percentiles

Figure 5.-- Scores of the fourth and fifth grades made on the Whistler-Thorpe Musical Aptitude Test in 1950. The mean of the raw scores are classified according to percentile norms. The numbers 4 and 5 refer to fourth and fifth grades.

Comparison of the Sixth and Seventh Grades on the Whistler-Thorpe Test:-- As may be seen in Table 6, the Whistler-Thorpe test for the sense of pitch reveals the mean of the sixth grade to be 9.12 points higher than the mean for the seventh grade. This when tested by the "t" technique is significant at the .01 level of confidence.

The scores of the sixth grade range from 6 to 30, and for the seventh grade from 5 to 25. This difference is 4 points, with the sixth grade having the larger range of scores. The standard deviations are separated by 2.30 points.

The writer therefore concludes that according to the Whistler-Thorpe battery the sixth grade is superior to the seventh grade in the sense of pitch, and there are 99 chances in a hundred in favor of this superiority.

According to Whistler-Thorpe norms, as seen in Figure 6, the sixth grade falls at the 99th percentile and the sixth grade at the 40th percentile.

The Whistler-Thorpe test, in the sense of rhythm reveals that the seventh grade is 9.20 points higher than the sixth grade. This when tested by the "t" technique is significant at the .01 level of confidence.

The scores for the sixth grade range from 6 to 25 and for the seventh grade from 6 to 30. This shows a difference of 5 points, with the seventh grade having the larger range of scores. The standard deviations are separated by .60 points, with the seventh grade having

the larger deviation.

The writer thus concludes that according to the Whistler-Thorpe test the seventh grade is superior rhythmically to the sixth grade, and there are 99 chances in a hundred in favor of this superiority.

According to Whistler-Thorpe norms, as seen in Figure 6, the sixth grade falls at the 60th percentile, and the seventh grade at the 99th percentile.

In the sense of melody the Whistler-Thorpe test reveals the mean of the sixth grade to be .63 points higher than the mean of the seventh grade. However, this when tested by the "t" technique is insignificant.

The scores for the sixth grade range from 5 to 25 and for the seventh grade from 5 to 25 also. Therefore, the range of scores is approximately the same for the two groups. The standard deviations are separated by 2 points.

The writer therefore concludes that according to Whistler-Thorpe norms the sixth grade falls at the 60th percentile and the seventh grade at the 40th percentile.

The writer thus concludes that according to Whistler-Thorpe test that the sixth grade is superior to the seventh grade in the sense of pitch. The seventh grade is superior to the sixth grade rhythmically. The sixth and seventh grades score about the same in the sense of melody.

TABLE VI

COMPARISON OF 24 SIXTH GRADE PUPILS WITH 25 SEVENTH GRADE PUPILS ON THE WHISTLER-THORPE TEST

Tests	Means		Standard Deviations		Difference Between Means	Standard Error of Difference Between Means	t*
	6th Gr.	7th Gr.	6th Gr.	7th Gr.			
Pitch	26.02	16.90	3.50	5.80	9.12	1.39	6.55
Rythm	18.30	27.50	5.00	5.60	9.20	1.54	5.97
Melody	14.13	13.50	5.75	3.70	.63	1.41	.44

*t at the .05 level of confidence is 2.018

t at the .01 level of confidence is 2.586

Percentiles

Sub-Tests	1	5	10	20	30	40	50	60	70	80	90	95	99	
Rhythm								6					7	
Pitch						7							6	
Melody						7		6						
	1	5	10	20	30	40	50	60	70	80	90	95	99	

Percentiles

Figure 6.-- Scores of the sixth and seventh grade scores made on the Whistler-Thorpe Test in 1950. The mean of the raw scores are classified according to percentile norms. The numbers 6 and 7 refer to sixth and seventh grades.

Comparison of the Sexes of the Fourth and Fifth Grades:-- As may be seen in Table 7, the Whistler-Thorpe test in the sense of pitch reveals the mean of the boys to be .35 points higher than the girls. This difference when tested by the "t" technique is not significant.

The scores of the girls range from 6 to 20, and of the boys from 6 to 20 also. Therefore, the range of scores of sexes is approximately the same. The standard deviations are separated by 2.15 points.

According to the Whistler-Thorpe test, it may be concluded that there is no significant difference between the sexes in pitch discrimination.

According to Whistler-Thorpe norms, as may be seen in Figure 7, the girls and boys fall at the 50th percentile.

On the Whistler-Thorpe test in the sense of rhythm, the mean of the girls is 1.35 points higher than the mean for the boys. This when tested by the "t" technique is insignificant.

The scores of the girls range from 6 to 20, and of the boys from 5 to 20. This difference is 1, with the boys having the 1 point larger than the girls. The standard deviations are separated by only .05 point.

One may conclude that the sexes score about the same on the test of rhythm on the Whistler-Thorpe test.

According to Whistler-Thorpe norms, as seen in Figure 7, both sexes fall at the 40th percentile.

The Whistler-Thorpe test reveals, in the sense of melody, the mean of the boys to be 8.42 points higher than the mean of the girls. This when tested by the "t" technique is significant at the .01 level of

confidence.

The scores of the girls range from 5 to 20, and of the boys from 5 to 29. This difference is 9, with the boys having the larger range of scores.

One may therefore conclude that according to the Whistler-Thorpe test, in the sense of melody the boys are superior to the girls, and there are 99 chances in a hundred that this superiority is not due to chance.

According to Whistler-Thorpe norms, as seen in Figure 7, the girls fall at the 5th percentile, and the boys at the 80th percentile.

The writer therefore concludes for the comparison of the sexes of the fourth and fifth grades on the Whistler-Thorpe test that there is no significant difference between the sexes in pitch discrimination. The sexes are about the same rhythmically. However, the boys are superior to the girls in melody.

TABLE VII

COMPARISON OF 27 FOURTH AND FIFTH GRADE BOYS WITH 26 FOURTH AND FIFTH GRADE GIRLS ON THE WHISTLER-THORPE TEST

Tests	Means		Standard Deviations		Difference Between Means	Standard Error of Difference Between Means	t *
	Girls	Boys	Girls	Boys			
Pitch	13.32	13.67	4.25	6.40	.35	1.51	2.31
Rhythm	14.65	13.30	3.75	3.70	1.35	1.03	1.31
Melody	6.92	15.34	2.00	6.50	8.42	1.33	6.33

* t at the .05 level of confidence is 2.018.
t at the .01 level of confidence is 2.586.

Percentiles

Sub-Tests	1	5	10	20	30	40	50	60	70	80	90	95	99	
Rhythm						G B								
Pitch							G B							
Melody		G								B				
	1	5	10	20	30	40	50	60	70	80	90	95	99	

Percentiles

Figure 7.-- Scores of the fourth and fifth grade boys and girls made on Whistler-Thorpe Musical Aptitude Test in 1950. The mean of the raw scores are classified according to percentile norms. The letters G and B refer to girls and boys.

Comparison of the Sexes of the Sixth and Seventh Grades on the Whistler-Thorpe Test:-- As may be seen in Table 8, the Whistler-Thorpe test, in the sense of pitch reveals the mean of the boys to be 1.51 points higher than the mean of the girls. This when tested by the "t" technique is insignificant.

The scores of the girls range from 5 to 25, and those of the boys from 6 to 25. This difference is only 1, with the girls having the larger range of scores. The standard deviations are separated by 2 points, with the boys having the larger deviation.

One may therefore conclude that according to the Whistler-Thorpe test the sexes are about the same in pitch discrimination.

According to Whistler-Thorpe norms, as seen in Figure 8, the girls fall at the 40th percentile and the boys at the 50th percentile.

In the sense of rhythm, the Whistler-Thorpe test reveals the mean of the girls to be .07 points higher than the mean of the boys. This when tested by the "t" technique is insignificant.

The scores of the girls range from 6 to 25, and those of the boys range from 11 to 25. This difference is 5, with the girls having the larger range of scores. The standard deviations are separated by 2 points, with the boys having the larger deviation.

One may conclude that according to Whistler-Thorpe test, though the girls are a few points ahead of the boys rhythmically that there is no significant difference. The sexes score about the same rhythmically.

According to Whistler-Thorpe norms both sexes fall at the 70th percentile, as seen in Figure 8.

In the sense of melody, the Whistler-Thorpe test reveals the mean of the boys to be 1.32 points higher than the mean of the girls. This when tested by the "t" technique is insignificant.

The scores of the girls range from 5 to 25, and those of the boys from 6 to 25. This gives a difference of only one point, with the girls having the one point larger range.

The writer therefore concludes that according to the Whistler-Thorpe test, though the boys are a few points ahead of the girls in melody, there is no significant difference in the sexes.

According to Whistler-Thorpe norms, as seen in Figure 8, the girls fall at the 70th percentile and the boys at the 80th percentile.

The comparison of the sexes of the sixth and seventh grades on the Whistler-Thorpe Tests provided no appreciable differences for any of the three tests of the battery.

TABLE VIII

COMPARISON OF 26 SIXTH AND SEVENTH GRADE BOYS WITH 23 SIXTH AND SEVENTH GRADE GIRLS ON THE WHISTLER-THORPE TEST

Tests	Means		Standard Deviations		Difference Between Means	Standard Error of Difference Between Means	t*
	Girls	Boys	Girls	Boys			
Pitch	15.46	16.97	6.50	5.00	1.51	1.68	.89
Rhythm	19.16	19.09	1.50	3.50	.07	.94	.07
Melody	15.46	16.78	6.50	3.50	1.32	1.49	.88

*t at the .05 level of confidence is 2.011

t at the .01 level of confidence is 2.683

Percentiles

Sub-Tests	1	5	10	20	30	40	50	60	70	80	90	95	99	
Rhythm									G B					
Pitch						G	B							
Melody									G	B				
	1	5	10	20	30	40	50	60	70	80	90	95	99	

Percentiles

Figure 8.-- Scores of the sixth and seventh grade boys and girls made on the Whistler-Thorpe Musical Aptitude Test in 1950. The mean of the raw scores are classified according to percentile norms. The letters G and B refer to girls and boys.

Comparison of the Fourth and Fifth Grades on the Drake Test:--

As may be seen in Table 9, the Drake test reveals the mean of the fifth grade to be 2.40 points larger than the mean of the fourth grade. This when tested by the "t" technique is insignificant.

The scores of the fourth grade range from 15 to 44, and those of the fifth grade from 25 to 55. This difference is only 1 point, with the fifth grade having the larger deviation. The standard deviations are separated by 4.66 points.

One may conclude that though the fourth grade is a few points ahead of the fifth grade in musical memory on the Drake test, the difference is not enough to be significant.

According to Drake norms as seen in Figure 9, the fourth grade falls at the 65th percentile, and the fifth grade at the 70th percentile.

TABLE IX

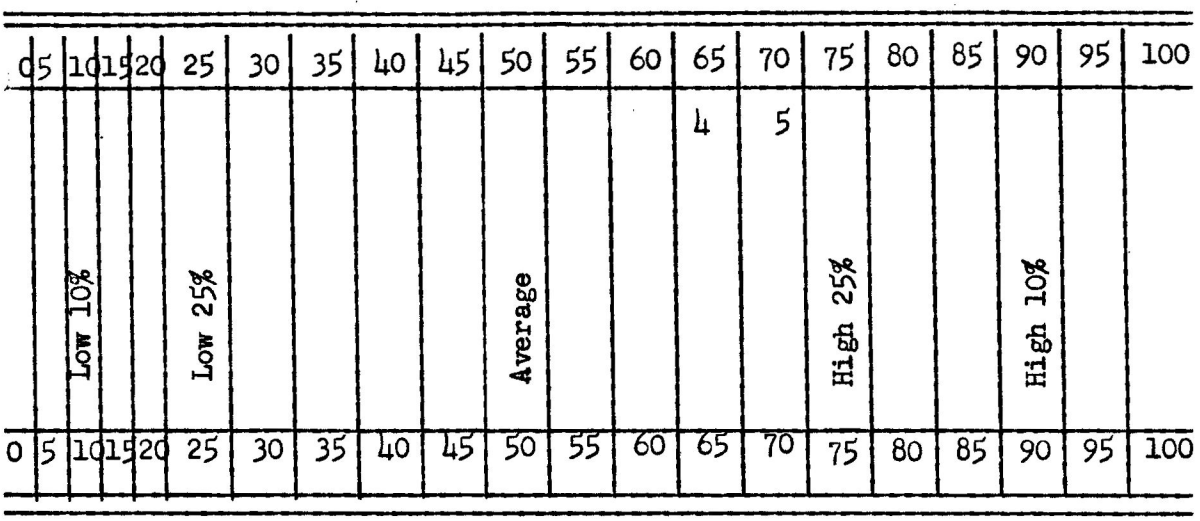
COMPARISON OF 27 FOURTH GRADE PUPILS WITH 26 FIFTH GRADE PUPILS ON THE DRAKE TEST

Means		Standard Deviations		Differences Between Means	Standard Error of Difference Between Means	t*
4th Gr.	5th Gr.	4th Gr.	5th Gr.			
33.75	36.15	8.60	3.94	2.40	1.84	1.30

*t at the .05 level of confidence is 2.008

t at the .01 level of confidence is 2.676

Percentiles



Percentiles

Figure 9.— Scores of the fourth and fifth grades made on the Drake Musical Memory Test in 1950. The mean of the raw scores are classified according to percentile norms. The numbers 4 and 5 refer to the fourth and fifth grades.

Comparison of the Sixth and Seventh Grades on the Drake Test:—

As may be seen in Table 10, the Drake test reveals the mean of the sixth grade to be 12.11 points higher than the mean of the seventh grade. This when tested by the "t" technique is significant at the .01 level of confidence.

The sixth grade scores range from 15 to 44 and those of the seventh grade from 9 to 44. This difference is 6 points, with the seventh grade having the larger range of scores. The standard deviations are separated by 13.50 points, with the sixth grade having the larger range.

One may conclude that according to the Drake test, the seventh grade is superior to the sixth grade in musical memory, and there are 99 chances in a hundred that this difference is not attributable to chance.

According to Drake norms, as seen in Figure 10, the sixth grade falls at the 65th percentile and the seventh grade at the 85th percentile.

TABLE X

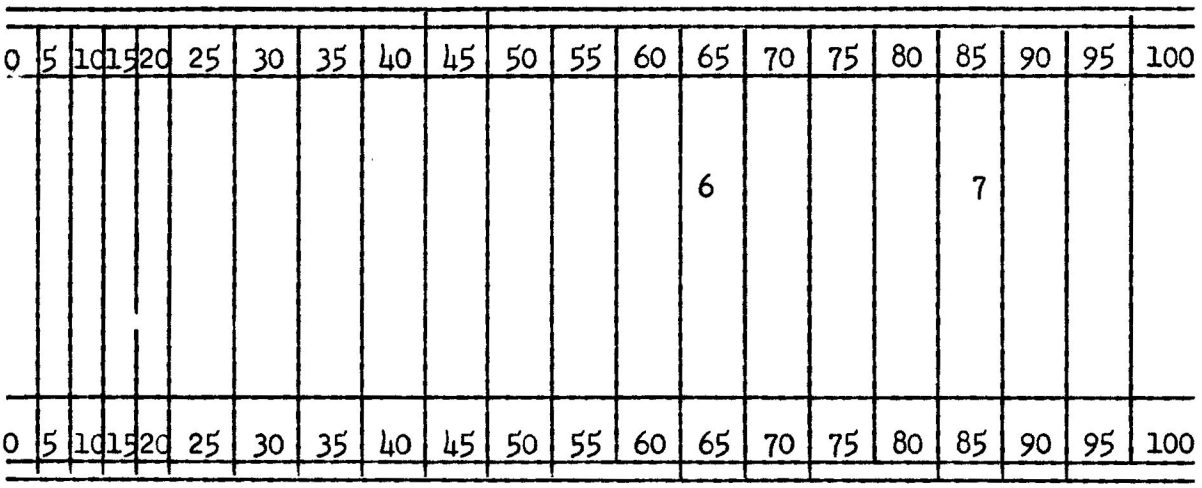
COMPARISON OF 24 SIXTH GRADE PUPILS WITH 25 SEVENTH GRADE PUPILS ON THE DRAKE TEST

Means		Standard Deviations		Difference Between Means	Standard Error of Difference Between Means	t*
6th Gr.	7th Gr.	6th Gr.	7th Gr.			
34.81	22.70	5.50	12.00	12.11	1.36	8.90

*t at the .05 level of confidence is 2.018

t at the .01 level of confidence is 2.586

Percentiles



Percentiles

Figure 10.-- Scores of the sixth and seventh grades made on the Drake Musical Memory Test in 1950. The mean of the raw scores are classified according to percentile norms. The numbers 6 and 7 refer to the sixth and seventh grades.

Comparison of the Sexes of the Fourth and Fifth Grades on the Drake Test:— As may be seen in Table 11, the Drake test reveals the mean of the boys to be 1.91 points higher than the mean of the girls. This when tested by the "t" technique is insignificant.

The scores of the girls range from 15 to 44, and those of the boys from 20 to 55. This shows a difference of 6 points, with the boys having the larger range of scores.

One can conclude however, that though the sexes vary a small amount in musical memory according to the Drake battery, the difference is not enough to be statistically reliable.

According to Drake norms the boys fall at the 65th percentile and the girls at the 55th percentile.

TABLE XI

COMPARISON OF 26 FOURTH AND FIFTH GRADE GIRLS WITH 27 FOURTH AND FIFTH GRADE BOYS ON THE DRAKE TEST

Means		Standard Deviations		Difference Between Means	Standard Error of Difference Between Means	t*
Girls	Boys	Girls	Boys			
34.07	35.98	4.00	6.00	1.91	1.42	1.34

*t at the .05 level of confidence is 2.008

t at the .01 level of confidence is 2.676

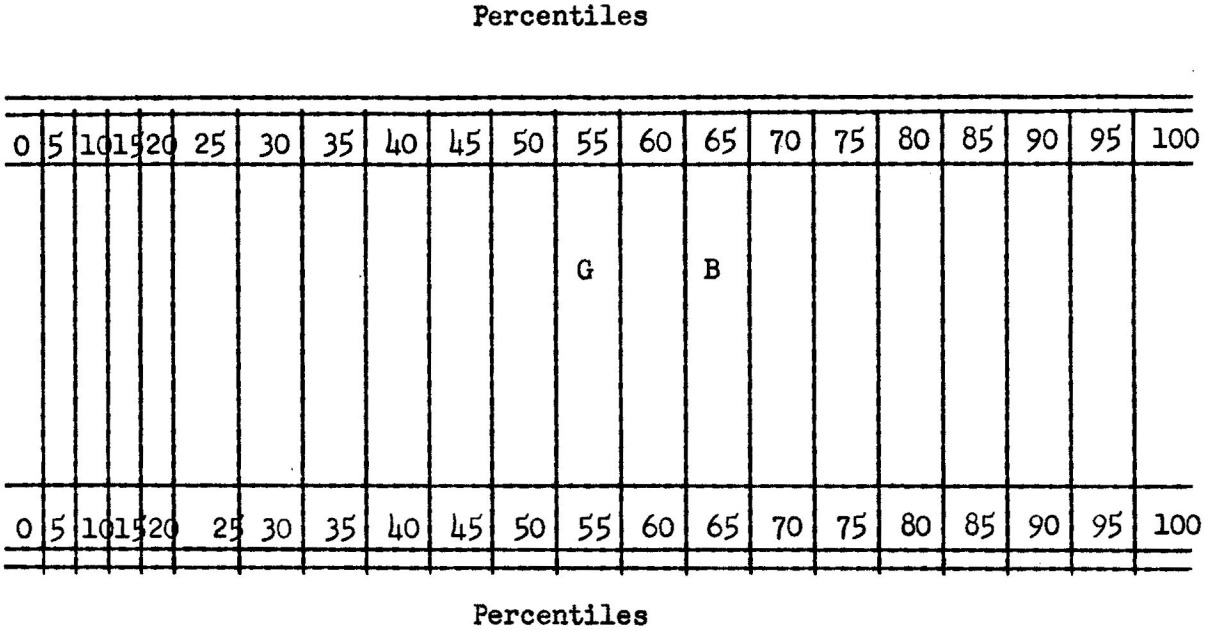


Figure 11.-- Scores of the fourth and fifth grade boys and girls made on the Drake Musical Memory Test in 1950. The mean of the raw scores are classified according to percentile norms. The letters G and B refer to girls and boys.

Comparison of the Sexes of the Sixth and Seventh Grades on the Drake Test:— As may be seen in Table 12, the Drake test reveals the mean of the boys to be 6.37 points higher than the mean of the girls. This when tested by the "t" technique is significant at the .05 level of confidence.

For the girls the scores range from 9 to 44, and for the boys from 9 to 40. This gives a difference of 4 points, with the girls having the larger range of scores. The standard deviations are separated by 4.5 points, with the girls having the larger deviation.

One may conclude that according to the Drake test the girls are superior to the boys in musical memory, and there are 99 chances in a hundred that this superiority is not due to chance.

According to Drake norms, as seen in Figure 12, the boys fall at the 70th percentile and the girls at the 85th percentile.

To summarize the data found by using the Drake battery the following conclusions are in order. There is no significant difference between the fourth and fifth grades. The sexes of the fourth and fifth grades score about the same in musical memory. The seventh grade is superior to the sixth grade in musical memory. And the sixth and seventh grade girls are superior to the sixth and seventh grade boys.

Profiles of Five Subjects Who Excelled on Seashore Tests of Musical Talent:— Figures 13 through 17 present the profiles for the five subjects who made the highest scores on the Seashore battery. There are three girls and two boys in this group.

As may be seen from an examination of these profiles, data are presented from the Otis Quick-Scoring Test of Mental Ability, Beta Form, and Metropolitan Achievement Tests in addition to scores derived from the three tests of music that were used in this study.

The profiles show that these subjects tend to score above the average on the other tests as well as on the tests of music. This suggests that those who are above the average of their group in performance on these music tests may be expected to do better than the average of the same group on other tests similar to the tests from which these profiles were made.

TABLE XII

COMPARISON OF 23 SIXTH AND SEVENTH GRADE GIRLS WITH 26 SIXTH AND SEVENTH GRADE BOYS ON THE DRAKE TEST

Means		Standard Deviations		Difference Between Means	Standard Error of Difference Between Means	t*
Girls	Boys	Girls	Boys			
24.46	30.83	11.0	7.50	6.37	2.78	2.29

*t at the .05 level of confidence is 2.011

t at the .01 level of confidence is 2.683

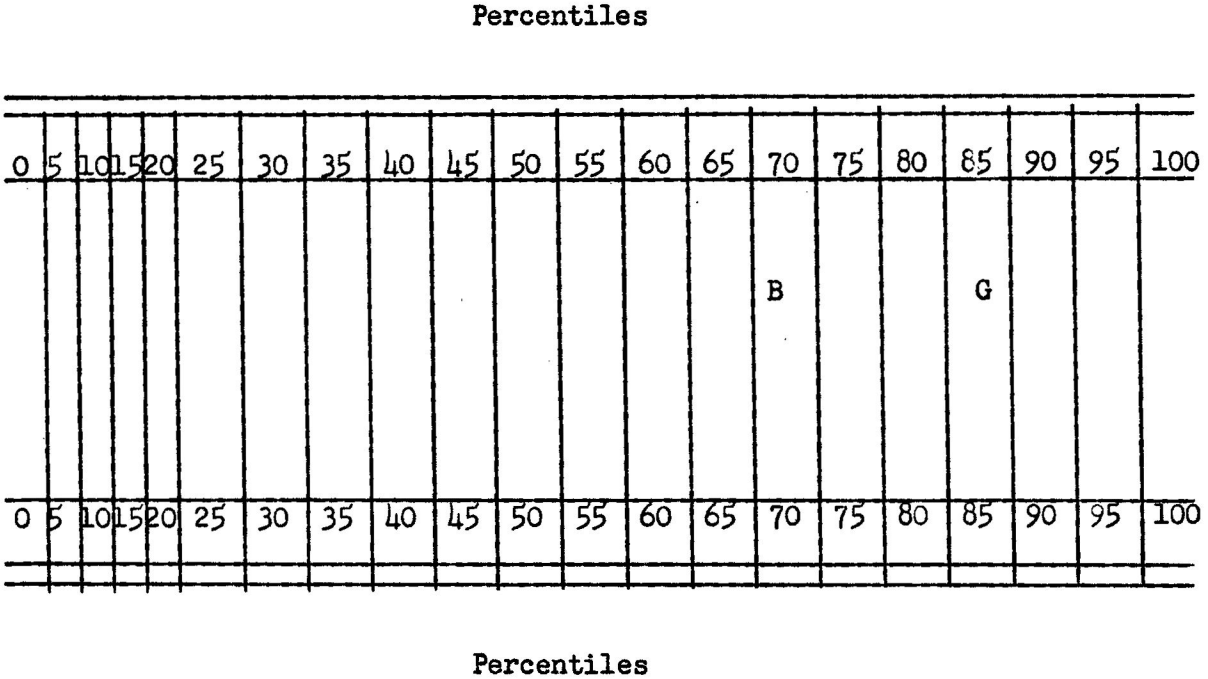


Figure 12.-- Scores of the sixth and seventh grade boys and girls made on the Drake Musical Memory Test in 1950. The mean of the raw scores are classified according to percentile norms. The letters B and G refer to girls and boys.

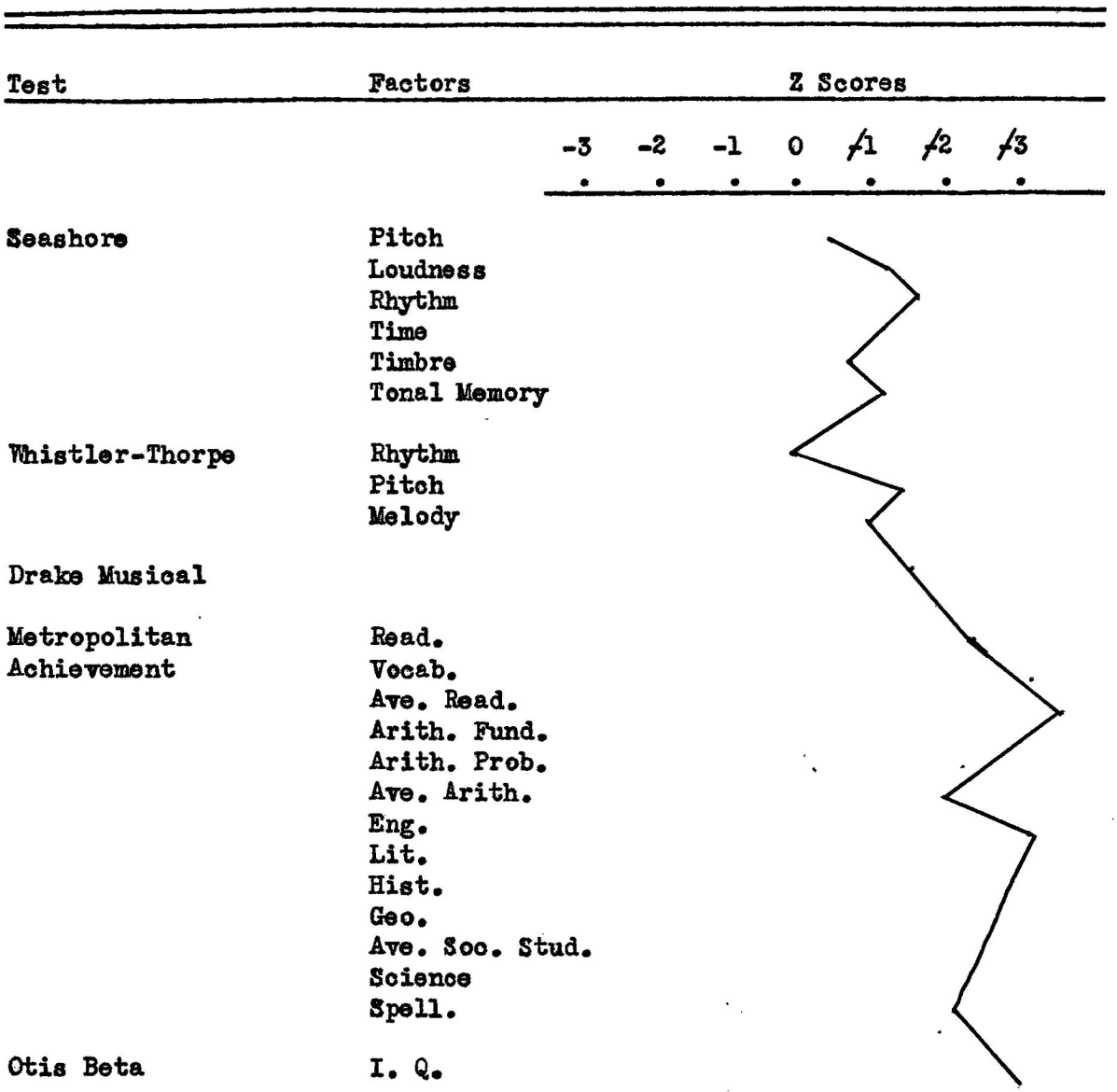


Figure 13.-- Profile graph of Billie Davis, a twelve year old Negro girl representing scores obtained on factors of Seashore Measures of Musical Talents, Whistler-Thorpe Musical Aptitude Test, Drake Musical Memory Test, Metropolitan Achievement Tests, and Otis Beta Intelligence Test.

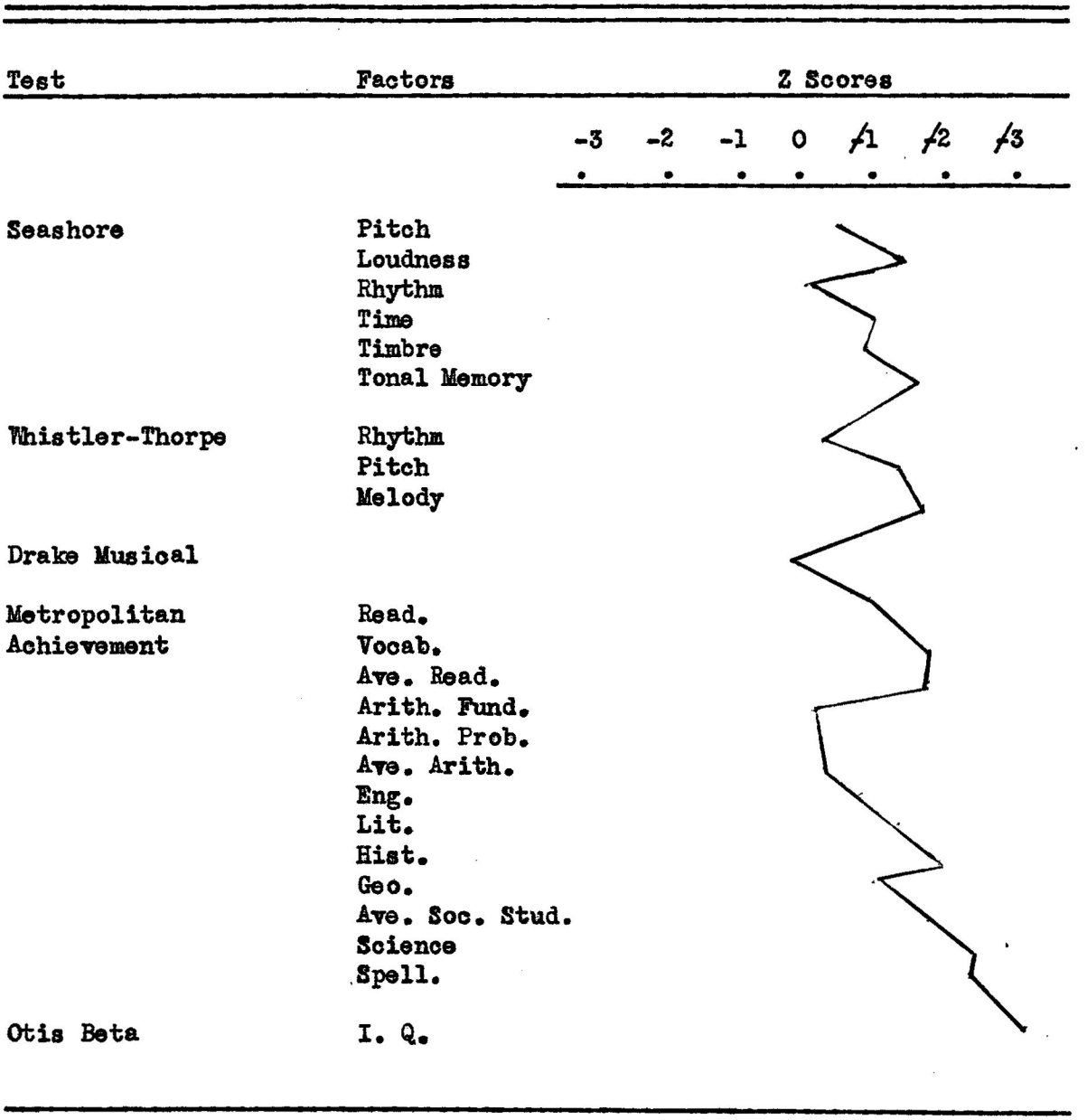


Figure 14.--- Profile graph of Maynard Jackson, a twelve year old Negro boy representing scores obtained on factors of Seashore Measures of Musical Talents, Whistler-Thorpe Musical Aptitude Test, Drake Musical Memory Test, Metropolitan Achievement Tests, and Otis Beta Intelligence Test.

Test	Factors	Z Scores
		-3 -2 -1 0 +1 +2 +3
Seashore	Pitch	
	Loudness	
	Rhythm	
	Time	
	Timbre	
	Tonal Memory	
Whistler-Thorpe	Rhythm	
	Pitch	
	Melody	
Drake Musical		
Metropolitan Achievement	Read.	
	Vocab.	
	Ave. Read.	
	Arith. Fund.	
	Arith. Prob.	
	Ave. Arith.	
	Eng.	
	Lit.	
	Hist.	
	Geo.	
	Ave. Soc. Stud.	
	Science	
	Spell.	
Otis Beta	I. Q.	

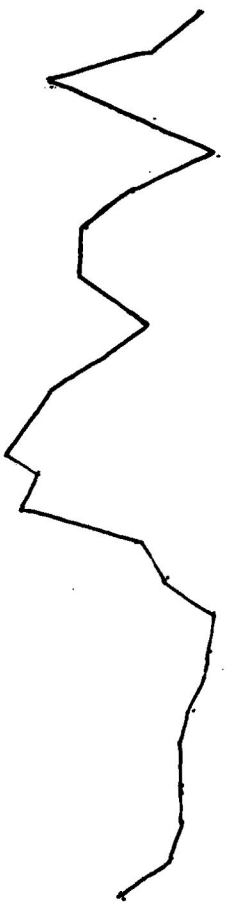


Figure 15.----- Profile graph of Robert Johnson, an eleven year old Negro boy representing scores obtained on factors of Seashore Measures of Musical Talents, Whistler-Thorpe Musical Aptitude Test, Drake Musical Memory Test, Metropolitan Achievement Tests, and Otis Beta Intelligence Test.

Test	Factors	Z Scores
		-3 -2 -1 0 +1 +2 +3
Seashore	Pitch	
	Loudness	
	Rhythm	
	Time	
	Timbre	
	Tonal Memory	
Whistler-Thorpe	Rhythm	
	Pitch	
	Melody	
Drake Musical		
Metropolitan Achievement	Read.	
	Vocab.	
	Ave. Read.	
	Arith. Fund.	
	Arith.Prob.	
	Ave. Arith.	
	Eng.	
	Lit.	
	Hist.	
	Geo.	
	Ave. Soc. Stud.	
	Science	
	Spell.	
Otis Beta	I. Q.	

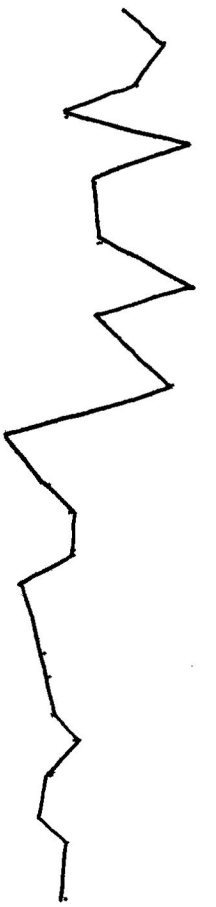


Figure 16.---- Profile graph of Patricia Acey, a twelve year old Negro girl representing scores obtained on factors of Seashore measures of Musical Talents, Whistler-Thorpe Musical Aptitude Test, Drake Musical Memory Test, Metropolitan Achievement Tests, and Otis Beta Intelligence Test.

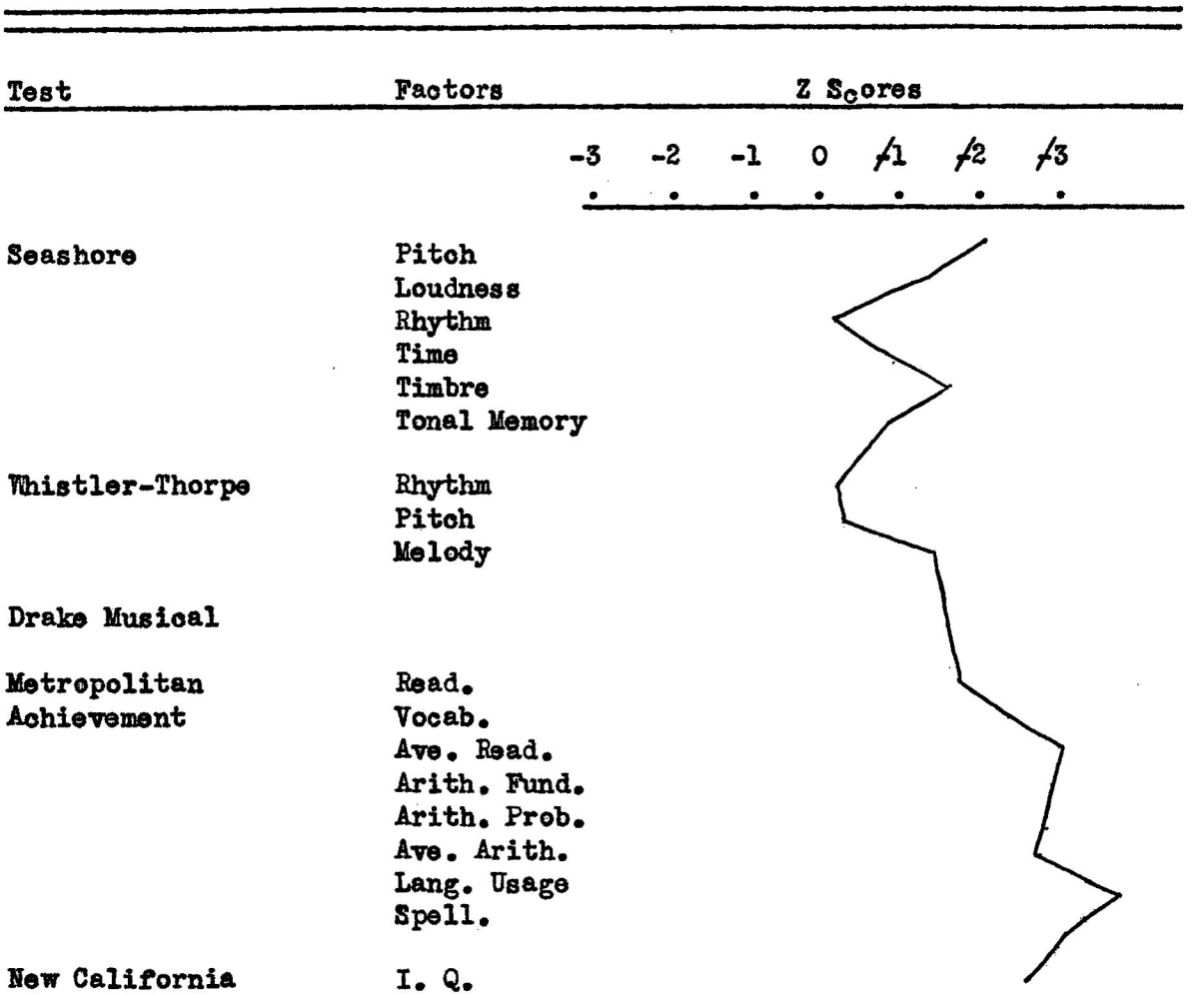


Figure 17.--- Profile graph of Corrine Johnson, an eight year old Negro girl representing scores obtained in factors of the Seashore Measures of Musical Talent, Whistler-Thorpe Musical Aptitude Test, Drake Musical Memory Test, and the New California Test of Mental Maturity.

CHAPTER III

SUMMARY AND CONCLUSIONS

Summary.-- This study was concerned with sex and grade comparisons for one-hundred-two elementary school pupils on three different tests of musical talent.

The Purposes Involved in this Study are:

1. A comparison was made of the fourth and fifth grade pupils on the Seashore test.
2. The sexes of the fourth and fifth grades were compared on the Seashore test.
3. A comparison was made of the sixth and seventh grades on the Seashore test.
4. The sexes of the sixth and seventh grades were compared on the Seashore test.
5. A comparison of the fourth and fifth grades on the Whistler-Thorpe test was made.
6. The sexes of the fourth and fifth grades were compared on the Whistler-Thorpe test.
7. The sixth and seventh grades were compared on the Whistler-Thorpe test.
8. The sexes of the sixth and seventh grades were compared on the Whistler-Thorpe test.
9. A comparison was made of the fourth and fifth grades on the

Drake test.

10. The sexes of the fourth and fifth grades were compared on the Drake test.
11. The sixth and seventh grades were compared on the Drake test.
12. A comparison was made of the sexes of the sixth and seventh grades on the Drake test.
13. Five students who excelled in the music tests were selected, and profiles were made to show musical talent and general achievement.

The study was completed during the summer of the 1950 school year. The subjects of the study were elementary pupils of Oglethorpe School, Atlanta, Georgia.

The Normative-Survey Method was used in gathering data for the study. The tests below were employed to make the comparisons which were studied.

1. The Seashore Measures of Musical Talents
2. The Whistler-Thorpe Musical Aptitude Test
3. The Drake Musical Memory Test

The data derived from the administration of the tests used in the study were tabulated, graphed, treated statistically, and interpreted with results reported in Chapter II.

Conclusions:-- The following conclusions are drawn directly from interpretation of the data collected in the study.

The fifth grade pupils are superior to the fourth grade pupils in the sense of pitch on the Seashore test. The fourth grade is superior to the fifth grade in the sense of loudness. The two grades score about the same on the sense of time and tonal memory. The fifth grade is superior to the fourth grade on the test of rhythm. For the sense of timbre the fourth grade is superior to the fifth grade.

As a result of the comparison of the sexes of the fourth and fifth grades on the Seashore test the boys are superior to the girls in pitch. The boys and girls score about the same on the tests of loudness, sense of time, tonal memory, rhythm and timbre.

On comparing the sixth and seventh grades on the Seashore battery the seventh grade is superior to the sixth grade in the sense of pitch. In the sense of loudness the two grades are about equal. This is true also for tonal memory and sense of time. The sixth grade is superior to the seventh grade on the test of rhythm. For the sense of timbre the seventh grade is superior to the sixth grade.

On comparing the sexes of the sixth and seventh grades on the Seashore battery the sexes score about the same in pitch discrimination. In the sense of loudness the girls are superior to the boys. In the sense of time the boys are superior to the girls. For tonal memory, the two grades are about equal. Rhythmically, the sixth grade is superior to the seventh grade. For the sense of timbre the seventh grade is superior to the sixth grade.

On comparing the sexes of the sixth and seventh grades on the Seashore battery the sexes seem to do about the same in pitch discrimination. In the sense of loudness the girls are superior to the boys. In the sense of time the boys are superior to the girls. For tonal memory the boys are superior to the girls. There seems to be very little difference, if any, between the two groups when compared on the tests of rhythm and timbre.

As a result of comparing the fourth and fifth grades on the Whistler-Thorpe test the fourth grade is superior to the fifth grade in pitch. As to rhythm, the two grades score about the same. The fifth grade is superior in the sense of melody.

On comparing the sixth and seventh grades on the Whistler-Thorpe test the sixth grade is superior to the seventh grade in the sense of pitch. Rhythmically, the seventh grade is superior to the sixth grade. In the sense of melody the two grades score about the same.

As a result of comparing the sexes of the fourth and fifth grades on the Whistler-Thorpe test the sexes of the fourth and fifth grades seem to demonstrate no significant difference in either pitch or rhythm. The boys are superior to the girls in melody.

On comparing the sexes of the sixth and seventh grades no significant difference occur for the Whistler-Thorpe test on pitch, rhythm, or melody.

As a result of the comparison of the fourth and fifth grades on the Drake test the two grades score about the same in musical memory.

The seventh grade is superior to the sixth grade in musical memory on the Drake test.

The sexes of the fourth and fifth grades on the Drake test are about the same in musical memory.

On comparing sexes of the sixth and seventh grades in musical memory on the Drake test the girls are superior to the boys.

The profile graphs of the five most talented students show that these subjects whose music scores are above the average for their respective groups also make scores on achievement and intelligence tests that are generally above the average for their groups.

From analysis of the data in this study several general conclusions and suggestions seem in order. For one thing it is clear that no one of these tests when considered as a whole may serve to compare "musical talent" between groups, for, as the literature shows and as this study suggests so-called "musical talent" is composed of several different abilities. This helps explain why it was found that the compared groups were alike on some tests of the same battery and different on others. Though not enough cases were analyzed to offer any substantial basis, it is indicated by the profiles in this study that the subjects who score highest on the music tests are among the better students in the groups to which they belong. Perhaps the most obvious conclusion to be drawn from this work is that the differences which are found in the study are not consistently in favor of either one group compared on the same test or a test of the same name.

NAME _____ DATE _____ HOUR _____

SCHOOL _____ CITY _____ GRADE _____ AGE _____

PITCH

	A	B	C	D	E
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

LOUDNESS

	A	B	C	D	E
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

RHYTHM

	A	B	C
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

REMARKS:

TIME

	A	B	C	D	E
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

TIMBRE

	A	B	C	D	E
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

TONAL MEMORY

	A	B	C
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Published by the
PUBLIC SCHOOL PUBLISHING CO.
Bloomington, Illinois

SCORE SHEET
FOR DRAKE MUSICAL MEMORY TEST

(One side may be used for Form A, and the other side for Form B.)

Name ..... *Age*..... (years months) *Form*..... (A or B)

City ..... *State*..... *Date*.....

Examiner..... *Grade*..... *School*.....

What instrument do you play?..... *or voice do you sing?*.....

How many months have you studied music? ..... *where?*.....

1. There are 12 trials of entirely different melodies.
2. Listen carefully to the first melody in each trial and remember it.
3. Listen to what is played next and compare it to the first melody to determine:
   a. if it is exactly the *same* as the first melody,..... if so record S.
   b. if it is the same melody played in a different *key*,..... if so record K.
   c. if the *time* has been changed,..... if so record T.
   d. if any *notes* have been changed,..... if so record N.

S=exactly the SAME melody. T=change of TIME.
K=change of KEY. N=change of one or more NOTES.

Practice exercise No. 1. ☐☐☐☐ Practice exercise No. 2. ☐☐☐☐

4. Record your answers in the score form given below.
5. Each trial will be announced by number. When you hear a number announced you will know that a *new* melody is to be played to which all melodies that follow, in that trial, are to be compared.
6. Record your answer during the short pause between each melody. Just time enough will be given to write your answer.
7. There is never more than one kind of change in any one comparison.
8. Fill in every square. Make the best judgment you can for each comparison.
9. Write clearly with capital letters.
10. In each trial, listen to the first melody. Wait until more is played and record whether it is the same, or if a change has been made in time, key, or notes.

IF THERE IS ANYTHING YOU DO NOT UNDERSTAND ASK ABOUT IT NOW.

Remember—

S=SAME

K=KEY change

T=TIME change

N=NOTE change

1.										
2.										
3.										
4.										
5.										
6.										
7.										
8.										
9.										
10.										
11.										
12.										

Errors

TOTAL ERRORS=FINAL SCORE

SCORED BY

_____

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Bloomington, Illinois

SCORE SHEET
FOR DRAKE MUSICAL MEMORY TEST

(One side may be used for Form A, and the other side for Form B.)

Name ..... *Age*..... (years months) *Form*..... (A or B)

City ..... *State*..... *Date*.....

Examiner..... *Grade*..... *School*.....

What instrument do you play?..... *or voice do you sing?*.....

How many months have you studied music? ..... *where?*.....

1. There are 12 trials of entirely different melodies.
2. Listen carefully to the first melody in each trial and remember it.
3. Listen to what is played next and compare it to the first melody to determine:
   a. if it is exactly the *same* as the first melody,..... if so record S.
   b. if it is the same melody played in a different *key*,..... if so record K.
   c. if the *time* has been changed,..... if so record T.
   d. if any *notes* have been changed,..... if so record N.

S=exactly the SAME melody. T=change of TIME.
K=change of KEY. N=change of one or more NOTES.

Practice exercise No. 1. ☐☐☐☐ Practice exercise No. 2. ☐☐☐☐

4. Record your answers in the score form given below.
5. Each trial will be announced by number. When you hear a number announced you will know that a *new* melody is to be played to which all melodies that follow, in that trial, are to be compared.
6. Record your answer during the short pause between each melody. Just time enough will be given to write your answer.
7. There is never more than one kind of change in any one comparison.
8. Fill in every square. Make the best judgment you can for each comparison.
9. Write clearly with capital letters.
10. In each trial, listen to the first melody. Wait until more is played and record whether it is the same, or if a change has been made in time, key, or notes.

IF THERE IS ANYTHING YOU DO NOT UNDERSTAND ASK ABOUT IT NOW.

Remember—

S=SAME

K=KEY change

T=TIME change

N=NOTE change

1.										
2.										
3.										
4.										
5.										
6.										
7.										
8.										
9.										
10.										
11.										
12.										

Errors

Total Errors=Final Score

SCORED BY

_____

	Possible Score	Pupil's Score	% ile Rank
I. RHYTHM	25		
PART 1	10		
PART 5	15		
II. PITCH	25		
PART 2	10		
PART 4	15		
III. MELODY (PART 3)	25		
TOTAL SCORE	75		

PROFILE
(CHART PERCENTILE RANKS HERE)

1 2 5 10 20 30 40 50 60 70 80 90 95 98 99

NAME _____ (LAST) _____ (FIRST) _____ (MIDDLE)

DATE _____ AGE _____ LAST BIRTHDAY _____ SEX: B _____ G _____

TEACHER _____ GRADE _____

SCHOOL _____ CITY _____

1. Are you a member of a chorus, choir, or glee club? (Yes No) If not, would you like to become a member? (Yes No)
2. Do you play an instrument? (Yes No) If so, what instrument? _____ (Name of Instrument)
   How long have you played it? _____ Years
3. Have you had private music lessons? (Yes No) If so, how long? _____ Years
4. Are you a member of an orchestra or band? (Yes No) If not, would you like to become a member? (Yes No)
5. If you do not play an instrument, would you like to learn how to play one? (Yes No)
   If so, write its name here _____

MUSICAL APTITUDE TEST, ANSWER SHEET No. 1740

DEVISED BY HARVEY S. WHISTLER AND LOUIS P. THORPE

SERIES - - - A B C (CIRCLE ONE)

DIRECTIONS: Mark on this answer sheet the letter or number of the answer which you have decided is correct. Make each mark as long as the pair of lines, and move the pencil point up and down firmly to make a heavy black line. If you change an answer, erase your first mark completely.

PART 1 Rhythm

SAMPLES A B

1 2 3 4 5 6 7 8 9 10

PART 2 Pitch

SAMPLE A

11 12 13 14 15 16 17 18 19 20

PART 3 Melody

SAMPLES A B

21 22 23 24 25 26 27 28 29 30

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45

PART 4 Pitch

SAMPLES A B C

46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

PART 5 Rhythm

SAMPLES A B

61 62 63 64 65 66 67 68 69 70 71 72 73 74 75

OTHER INFORMATION

1. _____
2. _____
3. _____
4. _____

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IBM FORM I.T.S. 1000 B 1740

THE APPENDIX

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